

Amendments to the Specification:

Please delete the heading “[Document Name] Specification” on page 1, line 1.

Please delete the heading “[Title of the Invention]” on page 1, line 2.

Please add the following heading after the title of the invention on page 1, line 3:

Background of the Invention

Please replace the heading on page 1, line 4 with the following rewritten heading:

{Field of the Invention}

Please replace the heading on page 1, line 8 with the following rewritten heading:

{Background ~~art~~ Art}

Please replace the paragraph beginning on page 1, line 9 through line 12, which starts with “A technique related to” with the following rewritten paragraph:

A conventional technique related to the electric motor is ~~disclosed in a Japanese patent No. 2,749,560 in which the~~ includes a gap between the stator teeth and the rotor magnet is being adjusted.

Please replace the paragraphs beginning on page 1, line 21 through page 2 line 23, which start with “The above constitution” with the following rewritten paragraphs:

The above constitution is devised to cope with the change in the specification of a product. In other words, the ~~means~~ device for adjusting the gap between rotor and stator related to an axial gap motor is disclosed as an embodiment capable of adjusting the gap only before the ~~means~~ device being attached to the product, not as an embodiment capable of adjusting the gap while the product is in operation for operating the product under an optimum condition. While part of the specification describes electromagnetic operation and manual operation, no specific

embodiment is disclosed. This is due to the absence of the necessity for examining a means of solving the problem of actively changing the characteristic of an electric motor such as the driving source of an electric motor vehicle by optionally changing the gap while the product is in operation.

~~There is another one disclosed in JP A Hei3-212154~~ Another conventional electric motor relateds to a reel motor for rotary-driving a reel of a tape recorder. The invention relates to an axial gap motor, disclosing a manner of adjusting the gap between rotor and stator by controlling the axial displacement using both a spring attached to a shaft and magnetic force of an electromagnet by changing the current flowing through the electromagnet in proportion to the current flowing through the motor. However, the gap adjustment in consideration of the motor rotational speed cannot be made with the combination of the spring and the electromagnet proportional to the current flowing through the motor. When the gap, as in the electric motor vehicle, must be adjusted to cope with the constant changes in the road conditions, such as uphill gradient and vehicle speed, it is impossible to do so with a gap controlling means device that makes all such conditions represented with the current flowing through the motor. Therefore, a more active and intelligent gap adjusting means device ~~has been~~ is needed.

~~There is another publication, JP A Hei 9-37598,~~ Another conventional electric motor relateds to a control device for a generator for use in vehicles. According to the invention, the generator characteristic is changed by adjusting the gap of a radial gap motor. However, because the rotor is displaced with a solenoid, fine control cannot be made and it is hard to apply the device to the motor in electric motor vehicles that require fine control according to the driving force and the vehicle speed. It is especially hard to realize the control in an axial gap type that exhibits a wide change in the characteristic with a slight change in the gap. While an example is shown there in which the stator is moved with a motor and screw, it is impossible to move the rotor, while it is rotating, with such a constitution.

Please replace the heading on page 2, line 24 with the following rewritten heading:

~~Disclosure of~~ Summary of the Invention

Please replace the paragraphs beginning on page 2, line 25 through page 3 line 35, which start with "In view of the above" with the following rewritten paragraphs:

In view of the above, for the electric motor capable of optionally changing the output characteristic, a ~~means~~ device is required to change the flux amount of a magnet by changing the relative distance between the rotor and stator in the axial direction. In particular for application to driving motors of electric motor vehicles, active and fine control is required. That is to say, a large amount of magnetic flux is required at the time of starting because starting requires a great torque, while a small amount of magnetic flux is required at the time of a high speed operation because the operation requires high rotational speed. For the electric motor vehicle, an electric motor of a high efficiency is also required to extend the cruising range. Accurate control is required to choose a motor current of a highest efficiency for obtaining an intended torque and revolution, and to choose the magnetic flux amount by changing the relative positions of the rotor and stator. There is another problem particular to the electric motor vehicle such that when the rider walks to roll the vehicle, extra effort is required as resisting force is produced with the attractive force between the stator and rotor.

Therefore, an ~~object~~ advantage of this invention is to provide a rotary electric machine capable of optionally changing its output characteristic and an electric motor vehicle using the rotary electric machine.

To solve the above problems ~~associated with the prior art, the invention according to Claim 1~~ an embodiment of the present invention relates to a rotary electric machine provided with: a rotary shaft; a rotor connected to the rotary shaft; a stator placed opposite the rotor; an adjusting motor for adjusting relative positions of the rotor and the stator in the direction of the rotary shaft; and a movable member that is engaged to the rotor and converts the rotation of the adjusting motor into the displacement of the movable member in the direction of the rotary shaft.

~~In the rotary electric machine according to Claim 1, the~~ The movable member moving in the axial direction with the rotation of the adjusting motor is engaged to the rotor. Therefore, it

is possible to adjust the gap between the rotor and stator if the rotary electric machine is of an axial gap type, adjust the opposing areas of the rotor and stator if the rotary electric machine is of a radial gap type, and adjust the gap between and the opposing areas of the rotor and stator if the rotary electric machine is of a conical gap type. Accordingly, the magnetic flux amount of the magnet can be actively adjusted. Therefore, it is possible to provide a rotary electric machine capable of optionally changing the output characteristic to produce a great amount of magnetic flux when a great torque is required and to produce a small amount of magnetic flux when a small torque is required, and further capable of reducing the rolling resisting force due to the attractive force of the motor magnet by reducing the magnetic flux amount when the rotary electric machine is used as the driving motor of an electric motor motorcycle.

Please replace the paragraph beginning on page 4, line 27 through line 36, which starts with "The invention according to Claim 2" with the following rewritten paragraph:

~~The invention according to Claim 2 relates to a rotary electric machine according to Claim 1, in which the~~ The rotor of the adjusting motor spirally engages with the movable member to permit relative motion. ~~In the rotary electric machine according to Claim 2, the~~ The rotor of the adjusting motor spirally engages with the movable member to permit relative motion. Therefore, a rotary electric machine is provided that makes it possible to control the amount of motion of the movable member by the rotation of the rotor of the adjusting motor relative to the movable member.

Please replace the paragraphs beginning on page 5, line 4 through page 7 line 37, which start with "The invention according to Claim 3" with the following rewritten paragraphs:

~~The invention according to Claim 3 relates to a rotary electric machine according to Claim 1 or 2, in which the~~ The movable member is rotatably engaged to the rotor, and a ~~means~~ device is provided for preventing the movable member from rotating together with the rotation of the rotor of the adjusting motor.

~~In the rotary electric machine according to Claim 3, the~~ The movable member is rotatably engaged through a bearing or the like to the rotor and is prevented from rotating together with the rotation of the rotor of the adjusting motor. As a result, it is possible to provide a rotary electric machine having the following features. It is possible to control accurately by securely moving the movable member in the axial direction by the rotation of the adjusting motor. Because the movable member does not rotate irrespective of rotating or standing state of the rotary electric machine, complicated control is unnecessary such as controlling the revolution of the adjusting motor depending on the rotating or standing state of the rotor of the rotary electric machine for the axial motion or controlling to rotate the rotor of the adjusting motor at the same speed as that of the rotor of the rotary electric machine when the rotor of the rotary electric machine is not moved in the axial direction. Because the adjusting motor has only to make rotation necessary for the amount of axial motion, consumption of electricity is reduced.

~~The invention according to Claim 4 relates to a rotary electric machine according to Claim 3, in which the~~ The movable member engages with the rotation stop member fit around the rotor shaft of the adjusting motor so as to be incapable of making relative rotation around but slidable in the axial direction of the rotor shaft of the adjusting motor.

~~In the rotary electric machine according to Claim 4, the~~ The rotation stop member fit around the rotor shaft of the adjusting motor prevents the movable member rotating relative to the rotor shaft of the adjusting motor but permits sliding in the axial direction of the rotor shaft of the adjusting motor. Therefore, it is possible to provide a rotary electric machine capable of securely preventing the movable member from rotating.

~~The invention according to Claim 5 relates to a rotary electric machine according to Claim 3 or 4, in which the~~ The rotation stop portion of the rotation stop member is formed in a particular shape in cross section.

~~In the electric motor according to Claim 5, the~~ The rotation stop portion of the rotation stop member is formed in a particular shape in cross section. Therefore, it is possible to provide a rotary electric machine capable of securely preventing the movable member from rotating. The term particular shape used herein means any shape other than circular.

~~The invention according to Claim 6 relates to a rotary electric machine according to Claim 3 or 4, in which opposing~~ Opposing surfaces of the movable member and the rotation stop member fit around the rotor shaft of the adjusting motor are each provided with at least one groove in the direction of the rotor shaft of the adjusting motor, and a ball is placed between each groove on the movable member side and each groove on the rotation stop member side.

~~In the electric motor according to Claim 6, opposing~~ Opposing surfaces of the movable member and the rotation stop member fit around the rotor shaft of the adjusting motor are each provided with at least one groove in the direction of the rotor shaft of the adjusting motor, and a ball is placed between each groove on the movable member side and each groove on the rotation stop member side. Therefore, rotation of the movable member is securely prevented with the grooves and balls, axial motion is made smooth while loss is reduced, and torque of the adjusting motor is reduced, so that downsizing is possible. Therefore, it is possible to provide a compact rotary electric machine.

~~The invention according to Claim 7 relates to a rotary electric machine according to any one of Claims 2 to 6, in which the~~ The rotor of the adjusting motor is in spiral engagement with the movable member.

~~In the electric motor according to Claim 7, the~~ The rotor of the adjusting motor is in spiral engagement with the movable member. Therefore, it is possible to provide a rotary electric machine capable of reducing the amount of motion of the movable member per revolution of the adjusting motor and capable of controlling more accurately.

~~The invention according to Claim 8 relates to a rotary electric machine according to any one of Claims 1 to 7, in which a~~ A spring is provided to urge the movable member in the direction of offsetting the force exerted to the movable member due to the magnetic attractive force produced between the rotor and the stator.

~~In the electric motor according to Claim 8, a~~ A resilient member is provided to urge the movable member in the direction of offsetting the force exerted to the movable member due to the magnetic attractive force produced between the rotor and the stator. Therefore, the force required to move the movable member is reduced, and the frictional force in the engagement

areas of the movable member and the rotor of the adjusting motor is reduced. As a result, it is possible to reduce the torque of the adjusting motor, to reduce the size and power consumption, and to provide a rotary electric machine that is compact with a high efficiency.

~~The invention according to Claim 9 relates to a rotary electric machine according to any one of Claims 1 to 8, in which the~~ The adjusting motor is a stepping motor. ~~In the electric motor according to Claim 9, because~~ Because the adjusting motor is a stepping motor, the amount of rotation can be controlled with the number of driving pulses. As a result, a sensor or the like for finding the amount of rotation (or amount of motion) is unnecessary, so that a rotary electric machine is provided in which the adjusting motor is made at a low cost and the control is simplified.

~~The invention according to Claim 10 relates to an electric motor vehicle using the rotary electric machine according to any one of Claims 1 to 9 as the driving source.~~

~~In the electric motor vehicle according to Claim 10, the rotary electric machine according to any one of Claims 1 to 9 is used as the driving source.~~ According to an embodiment of the present invention the rotary electric machine is used as a driving source. Therefore, it is possible to provide an electric motor vehicle capable of optionally changing its driving characteristic and reducing resisting force when the vehicle is rolled along by walking.

Please replace the heading on page 8, line 1, with the following rewritten heading:
{Brief Description of Drawings}

Please replace the paragraph beginning on page 8, line 6 through line 7, which starts with "Fig. 3 shows a cross sections" with the following rewritten paragraph:

Figs. 3(a), 3(b) and 3(c) shows cross sections as seen in the axial direction of the engagement portions of a slider 47a and a rotation stop member 99.

Please replace the heading on page 8, line 14, with the following rewritten heading:
{~~Best Mode for Embodying~~ Detailed Description of the Invention}

Please replace the paragraph beginning on page 9, line 23 through line 27, which starts with “Below the right and left” with the following rewritten paragraph:

Below the right and left vehicle frame members 11 are respectively attached footsteps 24 (only one is shown). A side stand 25 to be turned about a shaft 26 is provided at the lower part of the rear arm 20. The side stand 25 is urged with a return spring 27 toward an upward stowing side.

Please replace the paragraph beginning on page 9, line 35 through line 37, which starts with “In Fig. 2,” with the following rewritten paragraph:

In Fig. 2, the upward direction of the drawing corresponds to the right of the vehicle body while the leftward direction of the drawing corresponds to the front of the vehicle body.

Please replace the paragraph beginning on page 11, line 30 through page 12 line13, which starts with “The lower part of the movable” with the following rewritten paragraph:

The lower part of the movable member 47 is referred to as a slider 47a. Part of the upper outside circumference of the slider 47a is formed to be flat surfaces. A cylindrical rotation stop member 99 is placed coaxially around the upper outside circumference of the slider 47a. The inside circumference of the rotation stop member 99 engages with the upper outside circumference of the slider 47a, so that the rotation stop member 99 and the slider 47a engage with each other to rotate like a single member. However, the lower part of the rotation stop member 99 extends in a flange shape and secured to the case 201. Therefore, the slider 47a is permitted to move axially but prevented from rotating about its axis. The cross-sectional shape of the engaging portion of the slider 47a and the rotation stop member 99 may be a circle with at least one straight line as shown in Fig. 3(a), or a polygon as shown in Fig. 3(b). Furthermore, the shapes of the slider 47a and the rotation stop member 99 need not be generally similar but may be any ~~shapes~~ shape as long as they engage with each other to prevent relative rotation. Furthermore, it may be constituted as shown in Fig. 3(c) in which the opposing surfaces of the

slider 47a and the rotation stop member 99 are each provided with at least one axial groove and a ball such as a metallic ball is inserted between both grooves.

Please replace the paragraph beginning on page 13, line 30 through line 34, which starts with "The movable member 47" with the following rewritten paragraph:

The movable member 47 is adapted to convert the rotation of the stepping motor 60 into the axial motion of the movable member 47 itself. The converting action is made possible as the rotation stop member 99 prevents the movable member 47 from rotating along with the rotation of the rotor 62.

Please replace the paragraph beginning on page 19, line 11 through line 15, which starts with "Because the above-described" with the following rewritten paragraph:

Because the above-described rotary electric machine is used in the electric motorcycle 1 of this embodiment, it is possible to provide an electric motor vehicle that is capable of optionally changing the driving characteristic, and reducing the rolling resisting force produced with a magnetic attraction force.

Please replace the paragraph beginning on page 19, line 22 through line 35, which starts with "While this embodiment is" with the following rewritten paragraph:

While this embodiment is assumed to adjust the output characteristic by changing the gap in the axial gap type of the rotary electric machine, this invention does not limit the type of ~~the~~ rotary electric machine as long as the output characteristic is adjusted with the change in the amount of magnetic flux by adjusting relative axial positions of the rotor and stator of the rotary electric machine. For example, with a radial gap type of rotary electric machine having a cylindrical gap, the amount of magnetic flux may be changed by changing the opposing areas without changing the gap spacing with the axial relative position change between rotator and stator. Or with a rotary electric machine having a conical gap, the amount of magnetic flux may

be changed by changing both the gap spacing and opposing areas with the axial relative position change between rotator and stator.

Please replace the paragraph beginning on page 20, line 7 through line 22, which starts with “According to this invention” with the following rewritten paragraph:

According to this invention as described above, the movable member to be axially moved by the rotation of the adjusting motor is engaged to the rotor. Therefore, it is possible to actively adjust the gap spacing between the rotor and stator for the axial gap type of rotary electric machine, the opposing areas between the rotor and stator for the radial gap type of rotary electric machine, and both the gap and opposing areas between the rotor and stator for the rotary electric machine having a conical gap. Therefore, it is possible to provide a rotary electric machine capable of optionally changing the output characteristic by increasing the amount of magnetic flux when a great torque is required or by reducing the amount of magnetic flux when a high revolution is required. When the rotary electric machine is used as the driving source of an electric motorcycle, resisting force due to the magnetic attraction force of the electric motor can be reduced at the time of rolling by reducing the amount of magnetic flux.

Please replace the heading “[Claims]” on page 21, line 1 with the following rewritten heading:
Claim or {Claims}